AMENDMENTS TO THE CLAIMS

1-17. (canceled)

18. (previously presented) A method of monitoring or determining a flow rate of at least one fluid phase of a two or a three phase fluid flow in a closed conduit having a vortex flowmeter through which a fluid to be monitored flows, said flowmeter having a sensor adapted to provide a signal from which a shedding frequency may be derived, the method comprising:

obtaining the signal from the sensor and determining the shedding frequency value from the signal related to a frequency at which vortices are shed in the vortex flowmeter, and also determining from the signal a signal amplitude-related value related to an amplitude of the signal at the shedding frequency; and

using both the shedding frequency value and the amplitude-related value to determine the flow rate of the at least one fluid phase, said amplitude related value being used, at a particular shedding frequency, to assist in the determination of the flow rate of the at least one fluid phase.

19. (previously presented) A method according to claim 18, wherein the flow rates of two phases of the two phase fluid are simultaneously monitored using the amplitude-related value and the shedding frequency.

20. (currently amended) A method according to claim 18, wherein correlations of the shedding frequency and the amplitude-related value are ~~stored in a computer memory~~ recorded for correlating a range of different phase relative compositions and flow rates with corresponding shedding frequency and amplitude-related values, and wherein the shedding frequency and amplitude-related values are used to determine which correlation is used to determine the flow rate of the at least one phase, or the flow rate of both phases.

21. (previously presented) A method according to claim 20, comprising calibrating the flowmeter by recording the range of the correlations by passing a range of different fluids with known phase compositions, at different known flow rates, through the flowmeter and recording the shedding frequency and the amplitude-related values produced.

22. (previously presented) A method according to claim 18, comprising using a linear relationship between the shedding frequency and a total volume flow rate of all fluid phases to determine a total flow rate, and using the amplitude-related value to determine a relative amount of the different phases in the fluid.

23. (currently amended) Apparatus for monitoring or determining a flow rate of at least one phase of a two or a three phase fluid flow adapted to operate on a signal from a sensor of a vortex flowmeter to derive a shedding frequency value related to a shedding frequency of vortices in the flowmeter and also to derive an amplitude-related value related to an amplitude of the signal at the shedding frequency, and adapted to use the shedding frequency value and the amplitude-related value to determine the flow rate, said apparatus calibrated with ~~further comprising a computer processor and a computer memory containing a calibration~~ correlation data correlating, for a plurality of different fluid compositions, a plurality of different a total volume flow rate[[s]] with corresponding shedding frequency and amplitude-related value.

24. (canceled)

25. (previously presented) A method of calibrating a vortex flowmeter to enable a sensor of the flowmeter to provide a signal for which either a presence of a two phase fluid flow may be detected, or from which a flow rate of at least one phase of the two phase fluid flow may be determined, the method comprising:

determining, and recording, for the flowmeter, for a range of total volume flow rates, at a range of different amounts of each phase of the fluid, a shedding frequency and associated amplitude of the signal.

26. (previously presented) A method of detecting two-phase fluid flow in a closed conduit which has a vortex flowmeter though which a two-phase fluid flows, the method comprising obtaining from a sensor signal both a shedding frequency value related to a shedding frequency of vortices shed by the flowmeter, and also an amplitude value related to an amplitude of the signal, and using a significant change in the amplitude value to indicate a change between the fluid having one phase or two phases.

27. (currently amended) A method of monitoring a <u>multiple phase</u> fluid flow in a closed conduit including a disposition of a vortex flowmeter through which a fluid to be monitored flows which generates a signal indicative of a vortex shedding frequency associated with the fluid flow, comprising measuring a shedding frequency sensor signal and determining signal components relating to both the shedding frequency of the signal and an amplitude of the signal at the shedding frequency, and analyzing the shedding frequency and signal amplitude components of the signal to determine the at least one characteristic of the fluid flow.

28. (previously presented) A method of monitoring according to claim 27 for detecting a two-phase fluid flow comprising analyzing the shedding frequency and the amplitude signal components to detect a presence or an absence of the two-phase fluid flow.

29. (previously presented) A method of monitoring according to claim 28, comprising taking samples of a waveform of an oscillating vortex shedding frequency signal for a single phase fluid flow, obtaining a first frequency spectrum by taking a first Fast Fourier Transform, calculating a first logarithm of the values of the first frequency spectrum, and calculating a first mean value of the first logarithm of the values of the first frequency spectrum to provide a first datum for the single phase fluid flow, taking subsequent samples of the waveform of the oscillating vortex shedding frequency signal from the two-phase fluid flow, obtaining a second frequency spectrum by taking a second Fast Fourier Transform, calculating a second logarithm of the values of the second frequency spectrum, and calculating a second mean value of the second logarithm of the values of the second frequency spectrum to provide a second datum for the two-phase fluid flow and comparing the second mean value of the second logarithm against the first datum for the single phase flow to detect the presence or the absence of the two-phase fluid flow.

30. (previously presented) A method of monitoring according to claim 27, comprising analyzing the shedding frequency and the amplitude signal components to determine a volumetric flow rate of at least one phase of the fluid flow.

31. (previously presented) A method according to claim 27 for a liquid gas two phase fluid regime further comprising the steps of calibrating the flowmeter using a first reference flowmeter

to measure a liquid flow rate and a second reference flow meter to measure a gas flow rate thereby to determine a relationship between the signal amplitude components, the shedding frequency of vortices generated within the vortex flowmeter, the liquid flow rate and the gas flow rate.

32. (previously presented) A method according to claim 31, wherein the calibrating includes conducting a series of tests to provide a performance data over a range of flow rates with a single phase flow and the two-phase flow.

33. (previously presented) A method according to claim 32, wherein at least a step is performed from:

(i) a multi layer neural network is employed as a method of handling the performance data to provide measured values for a primary phase flow and a secondary phase flow;

(ii) an analytical method is employed to handle the performance data to provide measured values of a primary phase flow and a secondary phase flow;

(iii) the calibrating is conducted with the two-phase fluid flow on the basis of gas-in-liquid phases;

(iv) the calibrating is conducted with the two-phase fluid flow on the basis of liquid-in-gas phases.

34. (previously presented) A method according to claim 31, wherein a liquid is flowing at a constant rate and a gas is introduced at a point, thereby causing an increase in a mean velocity of the fluid flow, the increase in the mean velocity of the fluid flow being itself indicative of a presence of a secondary fluid phase.

35. (previously presented) A method according to claim 27, wherein an increase in the vortex shedding frequency occasioned by virtue of an increase in a mean velocity of flow is accompanied by a decrease in the amplitude of the shedding frequency signal in the sensor signal.

36. (previously presented) A method according to claim 34, wherein a decrease in the amplitude of the sensor signal is used as a determinant as to a presence of the secondary

fluid phase.

37. (previously presented) A method according to claim 27, wherein a relative magnitude of two phases is determined by analysis and manipulation of the sensor signal from the vortex flowmeter.

38. (previously presented) A method of monitoring according to claim 27 for detecting a two-phase fluid flow in the fluid flow in the closed conduit including the disposition of the vortex flowmeter through which the fluid to be detected flows, generating the signal indicative of at least one characteristic of the fluid flow, wherein measuring pressure fluctuations from an upstream to a downstream differential pressure across the vortex flowmeter, to generate a fluctuation signal, taking samples of a waveform of a differential pressure signal or a pressure signal and retaining the fluctuations associated therewith for a single phase fluid flow, obtaining a frequency spectrum by taking a Fast Fourier Transform of the signal, calculating a logarithm of the spectral values, and calculating a mean value of the logarithmic spectral values to provide a datum for the single phase fluid flow, taking subsequent samples of the waveform of the differential pressure or the pressure signal and retaining the fluctuations associated therewith from the two-phase fluid flow, obtaining a frequency spectrum by taking a Fast Fourier Transform, calculating a logarithm of the spectral values, and calculating a mean value of logarithmic spectral values, and comparing a logarithmic mean value against the datum for the single phase fluid flow to detect a presence or an absence of the two-phase fluid flow.